ROCKS and MINERALS

PUBLISHED MONTHLY

Edited and Published by PETER ZODAC

May 1944

Contents for May, 1944

CHIPS FROM THE QUARRY 134
THE ZEOLITE MINERALS WITH EMPHASIS ON A LOCALITY NEAR WASHINGTON. *By James H. Benn* 135
CHALCEDONY FROM BIG BEND PARK, TEXAS 141
JOHN AUGUST GRENZIG—1863-1944. *By Peter Zodac* 142
THE EVERLASTING HILLS—PROCLAIM IT. *By Mrs. A. C. Morris* 143
ARAGONITE FIRST FOUND IN SPAIN 143
JOHN A. GRENZIG (Obituary notice). *By Arthur Montgomery* 144
MOUNTAINS OF SALT IN COLOMBIA 144
EL VOLCAN DE POPOCATEPETL. *By Paul E. Killinger* 145
GOLD IN CUBA 145
SULTEPEC SILVER MINES OF MEXICO. *By Horatio C. Ray* 146
WORLD'S FINEST CINNABARS COME FROM CHINA 146
THE AMATEUR LAPIDARY. Amateur Lapidary Experience. *By J. E. Andress* 147
DYER SERPENTINE QUARRY NEAR DELIGHT, MD. *By Peter Zodac* 148
CLUB AND SOCIETY NOTES:
SAN JOSE CHAPTER OF THE R. & M. ASSOCIATION 149
JUNIOR MINERAL EXCHANGE 149
MINERALOGICAL CLUB OF HARTFORD 149
PACIFIC MINERAL SOCIETY 149
NEW YORK MINERALOGICAL CLUB 149
WITH OUR DEALERS 150
INDEX TO ADVERTISERS 167

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

Chips from the Quarry

PLEASE BE PATIENT!

From all over the country dealers report that they are so swamped with work that it is impossible to keep up with orders. We, too, are swamped with work and are weeks behind with correspondence. We, therefore, ask the indulgence of all readers, subscribers, members, and collectors that they continue to show patience and tolerance in their dealings with dealers and with ROCKS AND MINERALS. These are most difficult days in which we are now living. Materials and supplies are hard to obtain and very costly; workers, and especially in the mineralogical line, are almost unknown; transportation is very slow and at times uncertain. But we have a number of valuable assets in abundance among which are patience, tolerance, charity, hope, loyalty, patriotism—thank God America is filled to overflowing with these noble virtues. We can supply the whole world many times over and still have enough for ourselves.

SOME PLEASANT INCIDENTS OF THE WAR!

One of the very pleasant incidents of this war are the number of interesting letters received from members of the Rocks and Minerals Association who are serving their country on the far-flung battlefields of the world. At times their letters are so full of gracious thanks, because ROCKS AND MINERALS is sent them regularly, that we are humbled and depressed in not being able to do more for them. If ROCKS AND MINERALS—just a little magazine devoted to the fascinating study of rocks and minerals—can mean so much to a soldier, sailor, or marine on the fighting front, we wish it were possible to place a copy of it in the hands of every man or woman who are in the armed forces of our country.

Some soldiers and marines have actually sent us minerals from foreign lands. Guadalcanal and other parts of the Solomon Islands, New Caledonia, and Galapagos Islands are just three areas from which very interesting specimens have been sent us. For these and other expressions of their warm interest in ROCKS AND MINERALS, we are very deeply grateful.

Editor R&M:

Please keep ROCKS AND MINERALS coming for four more years. Enclosed is check as payment. It is indeed my shining hour when I find it waiting for me in the mail, after 10 hours of hard work for the war. The thrill happens only once a month. I am sorry it cannot be more frequently.

A. J. Slater,
Waterbury, Conn.

Editor R&M:

Enclosed find M. O. for $2 as renewal for my ROCKS AND MINERALS.

I'd sooner miss a meal than a single issue. It sure is a swell magazine.

Mike Almasi
Bremerton, Wash.

Which Is It?

A CLEAVAGE is a nice, flat break;
A FRACTURE's rough,—make no mistake.
LUSTER is what you SEE outside—
STRUCTURE is what it IS inside.

J. C. Boyle.

ROCKS and MINERALS

PUBLISHED MONTHLY

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May 1944

Vol. 19, No. 5

The Official Journal of the ROCKS and MINERALS ASSOCIATION

Whole No. 154

THE ZEOLITE MINERALS WITH EMPHASIS ON A LOCALITY NEAR WASHINGTON*

By JAMES H. BENN

Department of Geology, U. S. National Museum

The zeolites form one of the most interesting families in the mineral kingdom—interesting because of their diversity in form and their mode of occurrence. The term zeolite is derived from the Greek "zeo", meaning to boil. Thus they are given this name due to their ability to fuse generally with ease and with intumescence before the blowpipe flame. They are sometimes called "trap minerals", because they are often found in cavities and fissures of amygdaloidal trap-rock although they occur as well in basic eruptive-rocks. Your writer has been fortunate in having visited several zeolite localities in the eastern part of the United States; in doing so he has acquired a particular fondness for their beautifully formed delicate crystals. It is true that many other minerals surpass them in color, but what zeolites lack in this respect is more than made up in their variety of form and perfection of crystallization.

This family of minerals is a well defined group of hydrous silicates closely related in composition and occurrence. They are sometimes spoken of as analagous to the feldspars but they are unrelated in crystallization.

In composition zeolites are commonly silicates of aluminum with sodium and calcium, and occasionally with barium and strontium. Iron and other metals are at times present as impurities through impregnation or alteration. Their make-up in some cases corresponds to that of hydrated feldspar; Dana, states that by fusion and slow recrystallization, anorthite or calcium albite is produced. Water obtained from these minerals differs from ordinary water-of-crystallization in that, when a zeolite is heated water is released promptly and regularly and not in definite amounts at precise temperatures as is the case of most minerals; and too a partially dehydrated zeolite can again take up the same amount of water if exposed to water vapor. Apparently the atomic structure of the mineral remains intact unless the process is carried almost to completion. Indeed, the partially dehydrated zeolite is able to absorb other substances in place of water such as air, hydrogen sulphide, iodine, alcohol, etc. under experimental conditions. From this it may be assumed that the water of zeolites holds an unimportant place in the actual structure of these minerals, but may be merely present in the openings or channels of the crystals by absorption. Mr. Hey, of the Mineral Department of the British Museum, has made some very thorough studies and observations along this line. He has developed a theory applicable not only to zeolites but to any crystalline compound of a volatile and non-volatile component the crystal structure of which is such that all or a part of the volatile component can be removed without the

*Approved for publication by the Acting Secretary of The Smithsonian Institution.

structure collapsing. In this theory he explains that when the volatile component is water it does not undergo any change in molecular complexity in passing from crystal to vapour or the reverse. He also points out that the molecules are all structurally of the same kind except among zeolites where this is rarely the case; here the water molecules occupy two, three or more sets of lattice (structural) positions. He further observes, "In many zeolite structures there are cavities which might be occupied by water molecules but are not. Presumably the heats of hydration for these groups of lattice positions must remain practically empty. It is possible that a small degree of occupation of such 'forbidden' positions may account for the slight excess of water often found in zeolites after exposure to nearly saturated atmospheres, which excess is usually attributed wholly to absorption. And it is always possible that another volatile component might prove able to occupy these positions, though this is not likely to occur, as the affinity of a zeolite for water is generally greater than for any other vapour, except perhaps ammonia". Another peculiarity of this fascinating family is the fact that the alkali metal present in their compounds may be artificially replaced by silver or other metals.

In form the zeolites include independent groups diverse in crystallization. These groups are classified as the Monoclinic or Philipsite Group; the Rhombohedral or Chabazite Group; the Orthorhombic—Monoclinic or Natro'ite Group; and three other groups namely Mordenite, Heulandite and Thomsonite. The first three groups mentioned are represented on plate #1 by photographs numbers six, eight and three respectively.

As in other hydrous silicates, the zeolites are inferior in hardness, ranging from 3.5 to 5.5, and their specific gravity is lower than with corresponding anhydrous minerals, being in most cases from 2.0 to 2.4. Along with these properties they are peculiar in their reaction to acids, many of them becoming ge'atinized by hydrochloric.

In occurrence members of this family are found as secondary minerals filling cavities and veins, and lining crevices and fracture zones in basic igneous rocks such as basalt and diabase; rarely they may be found filling fractures in granite and some of the metamorphic rocks such as gneiss and schist. In all cases the lime and soda appear to have been derived by solution—in the former by deep seated hydrothermal action; in the latter by the altering of feldspathic material.

On plate #1 photographs of representative species of the various zeolite groups have been arranged. Although photographs do not do these specimens justice the reader will get some idea of their beauty.

Among those shown heulandite (1) and stilbite (2), have a strong pearly cleavage, the latter often being found in pearly radiations or sheaves; natrolite (3) and scolocite (4) are radiated needles and slender prisms, the natrolite at times becoming fibrous; thomsonite (5) occurs either radiated or compact, or in short crystals; while harmotome (6), analcite (7), chabazite (8) and the related gmelinite (9), occur only in short stout glassy crystals, those of chabazite sometimes looking like cubes.

For comparison with the above true zeolites, photographs have been arranged on plate #2 of minerals closely associated with them such as laumontite (10), noted for its tendency to crumble on exposure to air; pectolite (11) which may be fibrous or in radiating needles resembling natrolite (3) and scolocite (4); apophyllite (12) having one pearly cleavage like heulandite (1) and stilbite (2); prehnite (13), botryoidal crystal aggregrates usually of an apple green color; datolite (14) in stoutish glassy complex crystals which at times may assume a smooth botryoidal form; calcite (15) with its three directions of like cleavage; and quarttz (16) crystallized but found also as a cryptocrystalline variety such as chalcedony. Of all these species calcite and quartz are most common.

Among the famous zeolite localities of the world may be mentioned Poonah,

India; Iceland; Nova Scotia; and Paterson and West Paterson, New Jersey. At Poonah and Nova Scotia the zeolites occur in amygdaloidal trap-rock. In Iceland they occur in eruptive volcanic rocks and in the northeastern New Jersey area they are found in the basic igneous rock of that region. Of the above localities the writer has visited but one, namely Paterson. Here he was particularly impressed with the fine specimens of prehnite, apophyllite, and natrolite. Likewise he has visited Moore's Station, New Jersey and the trap-rock quarry on Goose Creek, Virginia, two less celebrated localities.

At Moore's Station the occurrence of zeolites is similar to that found at Paterson. Here may be seen the result of hydrothermal action of deep seated water forcing its way up through fissures of the diabasic rock and upon cooling depositing minerals from solution along the zones of egress. Most interesting to the collector are the fine stilbites to be had at this locality many of which are a rich orange color due to impurities of iron.

The Goose Creek trap-rock Quarry has been visited on a number of occasions the last having been made in company with the Mineralogical Society of Washington, on October 17th, 1943. A photograph taken by Mr. C. H. Robinson, President of the society, showing a view looking across the floor to the wall of the quarry is pictured on plate #3. Although the minerals to be found there are small, one is intrigued by their variety. The locality is a pleasant journey of between 35 and 40 miles from Washington and may be recommended as an educational and profitable day's outing for the collector not expecting something ultra-spectacular. The place may be reached either by rail or automobile. If by rail, one takes the cars from Roslyn, Virginia, at the far end of Key Bridge from Washington, getting off at Trap-Rock Station which is right at the quarry; if by auto one proceeds from Washington along the old Leesburg Pike to within a quarter of a mile of the Goose Creek bridge and then turns left along a dirt and gravel road to where it crosses the railroad, at which point just before the crossing a gravel road turns right leading directly to the stone crusher and open cut.

The locality now under discussion is an open quarry in the basic igneous rock diabase, about four miles southeast of Leesburg, Virginia, along the Old Dominion Railway. It is worked for trap-rock which is then crushed and used for road building and repairing.

The ridge on which the quarry is situated is entirely composed of intrusive or trappean rock. Most of the rocks appearing at the surface of the surrounding country are of sedimentary origin and consist of sandstone, shale, and limestone all presenting great variety in composition and appearance. The materials of which they are composed were originally gravel, sand, and mud derived from the waste of older rocks. Just to the east of the quarry, where the railroad passes through a cut, may be seen baked and mottled Triassic slaty-shale, the result of contact metamorphism. This type of geology gives rise to mineralized areas and is consistent with other mineralized zones in the east, where basic igneous rocks have intruded earlier sedimentary rocks and created zeolite localities.

Diabase is essentially the rock exposed in the quarry. Next in abundance comes material which does not differ greatly in composition from ordinary diabase but which is very coarsed grained. Specimens of the maximum coarseness contain augite blades ten inches in length and one half inch in width! A third type consists of small rock masses of coarse texture but composed mainly of albite and quartz, and augite which has been more or less replaced by diopside. This third type shows small cavities containing contemporary crystals of quartz, albite, titanite, and diopside, and also exhibits a later series of minerals consisting of fine fibrous hornblende, epidote, chalcopyrite and chlorite. There is a fourth type of rock, also composed mainly of quartz and albite; it occurs in dikes filling narrow cracks in the normal

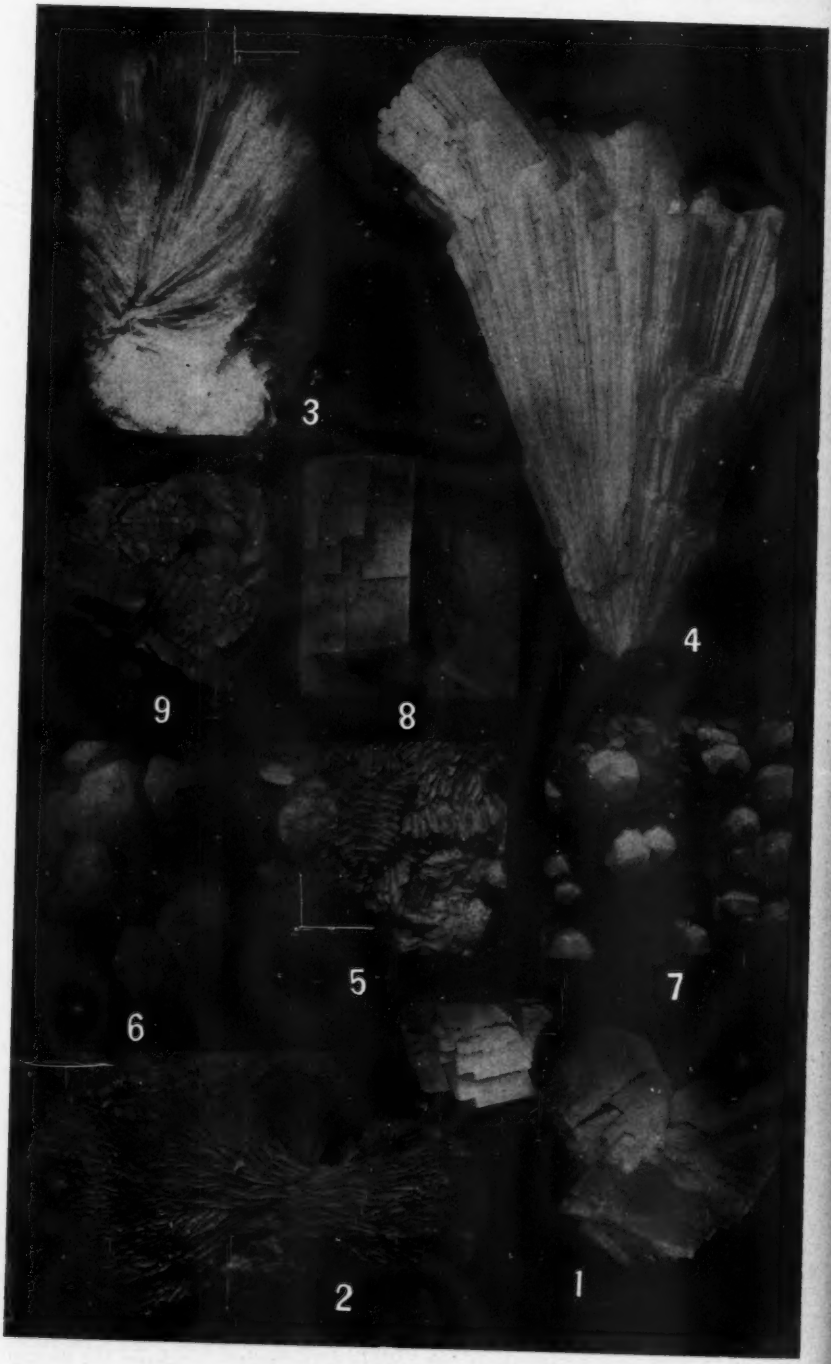

PLATE #1

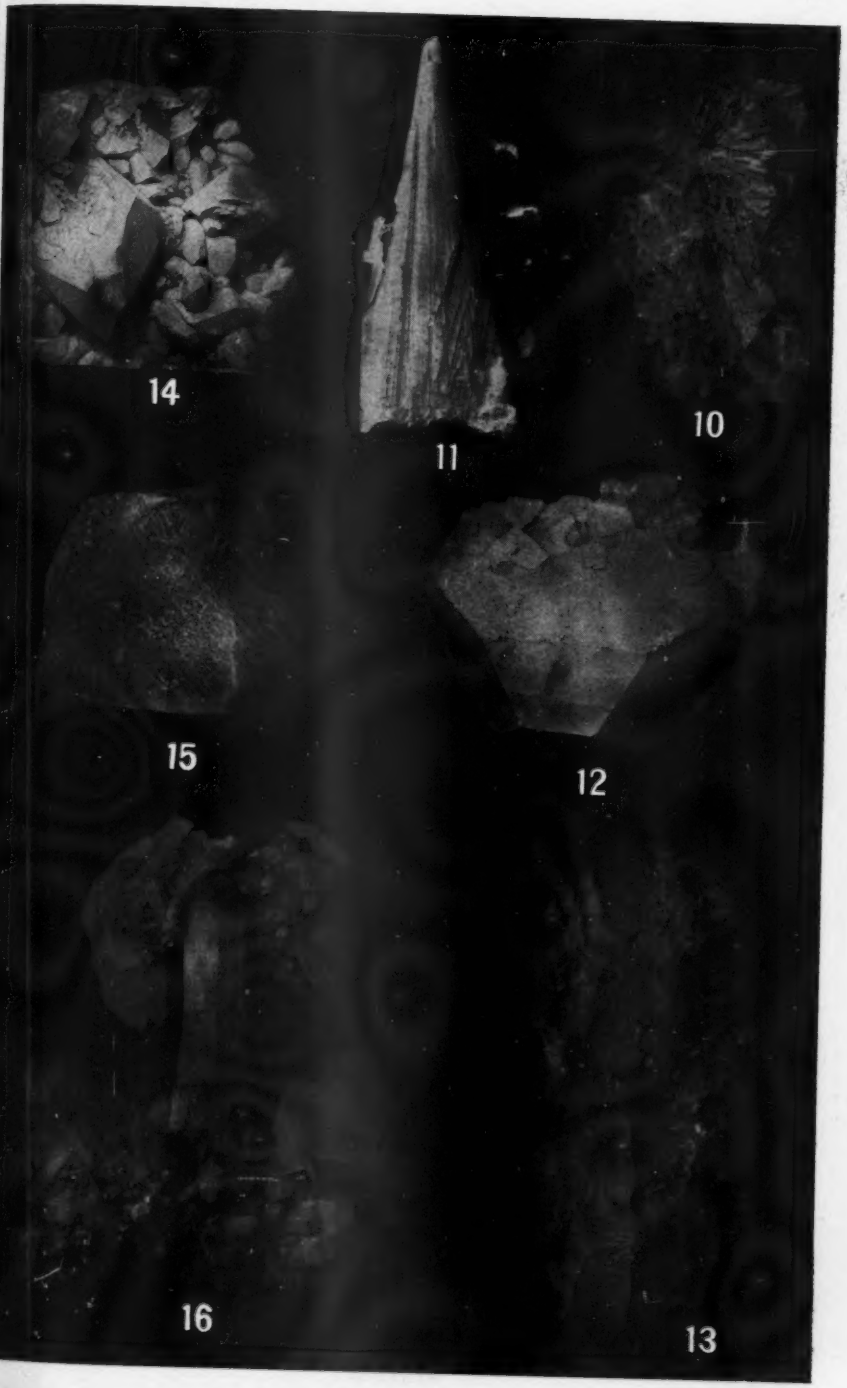

PLATE #2

PLATE # 3

diabase.

Numerous joints, fissures and crevices cut the afore-mentioned types of rock. The contacting rocks of various type inclosing and surrounding this intrusive mass, show hydrothermal alteration, the cracks and open spaces being filled with minerals from solution. These minerals consist of hornblende and chlorite; epidote and albite; galena, chalcopyrite, pyrite; diposide and axinite; datolite, prehnite, apophyllite, quartz, calcite, laumontite, chabazite, stilbite and others.

According to Mr. Shannon, the limits of the quarry would appear to represent a change from the original diabase through a series of magmatic alterations into high temperature hydrothermal deposits—his point being established by the presence of hornblende in cracks, minerals in cavities and a later gradation of characteristic zeolite deposits found in the veins. He also found that no difference in time, of the mineralization of the cracks and cavities and the zeolitic veins, can be made. It is evident from the foregoing that the deposits of vein minerals were made by magmatic water, the product of the diabase, ascending with hydrothermal action through fissures in the previously consolidated material.

Preferred references:

1—Harpers Ferry Folio #10, U. S. Geological Survey, by Arthur Keith.

2—Jurassic Intrusives of Virginia, PAN-AMERICAN GEOLOGIST, Vol. 39. pp. 289-296, May, 1923, by Joseph K. Roberts.

3—MANUAL OF MINERALOGY AND LITHOLOGY, by James D. Dana.

4—The Mineralogy and Petrology of Intrusive Triassic Diabase at Goose Creek, Loudown County, Virginia, PROCEEDINGS OF THE U. S. NATIONAL MUSEUM. Vol. 66, art. 2, pp. 1-86, 1924, by Earl V. Shannon.

5—Studies on the Zeolites, Part VIII—A Theory of the Vapour pressure of the Zeolites, and of the diffusion of Water or Gases in a Zeolite, MIN. MAG., Vol. XXIV, p. 99, Sept. 1935, London, England, by Max H. Hey.

Description of plates:

Plates #1 and #2.

Fig. #1 Heulandite, Berufiord, Iceland. U. S. N. M., catalog # R-4067.
" #2 Stilbite, West Paterson, New Jersey. U. S. N. M., catalog # C-3447.
" #3 Natrolite, Paterson, New Jersey. U. S. N. M., catalog # R-4233.
" #4 Scolocite, Ponah, India. U. S. N. M., catalog # R-4301.
" #5 Thomsonite, Paterson, New Jersey. U. S. N. M., catalog # C-3619.
" #6 Harmotome, Argyllshire, Scotland. U. S. N. M., catalog # 103261.
" #7 Analcite, Bergen Hill, New Jersey. U. S. N. M., catalog # C-3551.
" #8 Chabazite, West Paterson, New Jersey. U. S. N. M., catalog # C-3491.
" #9 Gmelinite, Parrsboro, Nova Scotia. U. S. N. M., catalog # 14193.
" #10 Laumontite, Baltimore, Md. Courtesy of F. A. Rapp.
" #11 Pectolite, Union Hill, New Jersey. U. S. N. M. catalog #C-2470.
" #12 Apophyllite, Bergen Hill, New Jersey. U. S. N. M. catalog #C-3336.
" #13 Prehnite, Loudoun Co., Virginia. Courtesy of F. A. Rapp.
" #14 Datolite, West Paterson, New Jersey. U. S. N. M. catalog #C-3048.
" #15 Calcite, Great Notch, New Jersey. U. S. N. M. catalog #C-1921.
" #16 Quartz, Morris Co., New Jersey. U. S. N. M. catalog #C-1107.

Plate #3.

Upper left, Augite pegmatite in diabase showing well developed augite blades, Goose Creek Quarry.

Upper right, Typical zeolitic vein showing apophyllite, calcite, and prehnite, Goose Creek Quarry.

Lower, View of Goose Creek Quarry showing joints and fissures.

Acknowledgment:

The writer thanks Dr. R. S. Bassler for the photographs of the minerals, dike and vein illustrated and Mr. C. H. Robinson for the picture of Goose Creek Quarry.

CHALCEDONY FROM BIG BEND PARK, TEXAS

Very nice botryoidal specimens of chalcedony, also as small geodes, of a bluish-white color, occur on Sierra Oguja Peak, in southwestern Texas. Sierra Oguja Peak, 5,810 ft. high, is in the Big Bend Park of southern Brewster County whose southern boundary is the Rio Grande.

Some of the chalcedony is coated with white crusts of drusy quartz; small rock crystals also occur in the geodes.

The original find was made by CCC boys in 1940.

JOHN AUGUST GRENZIG

June 30, 1863 — April 8, 1944

John August Grenzig, one of America's most noted mineral dealers, died on Sat., April 8, 1944, in his 80th year. Death was due to lobar pneumonia following two prostate gland operations at St. Mary's Hospital. Burial was in Mount Grace Evergreen Cemetery, Brooklyn. Services were conducted by Pastor Frederick B. Morley, of Woodhaven Methodist Church.

Mr. Grenzig was born in Berlin, Germany, on June 30, 1863, the son of Mr. and Mrs. August John Grenzig. At the age of 7 he accompanied his parents to America where they made their new home in Brooklyn, N. Y.

At the early age of 9, Mr. Grenzig became curious about and attracted to minerals and began to save every odd pebble that he found. His boyish minerals were nothing more than like any rock collection of any youngster of that age but like many another youngster it was not a passing fancy. He kept adding to and improving his collection as time went on so that in later years it was considered to rate among the first ten of the country. His collection of micromounts, about 1500 in all, was outstanding, too, for beauty and quality.

Mr. Grenzig was a graduate assayor of Cooper Union, New York City. But because he was very devoted to his parents, he would not accept positions in this field that invariably would have taken him out West. His mother lived to the ripe old age of 88 and his father died at the age of 76, rather prematurely as a result of an accident. By this time Mr. Grenzig was getting along in years himself and for that reason did not then follow up his profession.

Mr. Grenzig's business was that of an electrical contractor with office and shop at 299 Adams St., Brooklyn. His side line as a mineral dealer began many years ago in this way. Whenever any of his mineralogical friends dropped in at his office, he would always invite them to his home to see his collection and talk minerals. As the Grenzigs lived quite a ways out on Long Island (Brooklyn being at its western extremity), and his friends were generally short of time, very few could visit his home. So little by little he began to bring specimens to the office. The dealing part of it was the outgrowth of doing favors for his collector friends. "Could you get me some micro mount boxes or do you know where I could get this or that kind of a specimen?" Mr. Grenzig was rather an odd type of individual. Money seemed to be his last concern. If he could do some one a favor and make that person happy why he was paid in full. The result was that in later years his efforts to please collectors grew to such proportions that he often forgot his living was in the contracting business.

It may not be generally known that Mr. Grenzig was an authority on fluorescence. Long before this subject was commercialized, he practiced with it as a hobby and lectured on it. At his place of business he has had for years a dark room wherein he had on display many fluorescent minerals and lamps of various wave lengths. To those who saw the display it was a thing of wonderment. In addition to the many fluorescent minerals on display, there were also pictures on which he had patiently pasted ground fluorescent minerals so that when the ultra violet light shown on them one would see green grass, various flowers blooming in a garden, a gravel path, and a light beaming from a window. A thing of beauty does not exmineralogical art.
press it. It really was a wonderment of

Mr. Grenzig took a great deal of delight in trying to interest the young folks in minerals. He often held meetings at his home for the public school and high school students in the hope of

interesting them in the subject.

For years, one of the most faithful attendants at any mineralogical function held around New York City—be it field trip, club meeting, or exhibit—was Mr. Grenzig. No activity of any kind, it seemed, ever got under way until Mr. Grenzig made his appearance.

One of the happiest moments for Mr. and Mrs. Grenzig took place on April 13th, 1939, when they celebrated their 50th wedding anniversary. Their children gave them a blow-out at which were gathered some 120 members of the family, and friends from far and wide. As one member of the family recently put it: "It is not only a wonderful memory for mother but for us children as well. I never realized father had such a host of friends. I never saw such a display of flowers from all over the country. There was a continuous flow of messenger boys with telegrams and well wishes from the far corners of the country. It is really too bad that our Creator saw fit to take father away a few days before they would have celebrated their 55th anniversary. A family reunion was planned but it was not to be."

Mr. Grenzig was a member of many mineralogical clubs including the Rocks and Minerals Association.

Mr. Grenzig is survived by his wife, Mrs. Mary A. Grenzig, two sons, August John of Brooklyn, and William of Pittsburgh, Penn., seven grandchildren, and four great gandchildren. There was a daughter, Helena, who passed away Dec. 8, 1941. Mr. Grenzig had a sister, Helena, who died many years ago.

Mrs. Grenzig, and son, August J., are selling out Mr. Grenzig's stock of minerals.

Peter Zodac.

THE EVER-LASTING HILLS — PROCLAIM IT

By MRS. A. C. MORRIS
Greenfield, Missouri

Recently while examining my collection, I noticed a well formed V among the specimens. Naturally my first thought was "V for Victory".

I then began looking for other letters. I have been rewarded by finding all the letters needed to spell "Victory".

V—Well formed, bright pink vein in red and black granite from Little Falls, Minnesota.

I—White Opalite vein passing directly through the center of a dark red, circular jasper pebble from Portland, Oregon.

C—Crevice in pastel flint filled with sparkling quartz crystals from Greenfield, Missouri.

T—White marking on dark green rock from Grand Canyon, Colorado.

O—A white circle in dark gray limestone from Greenfield, Missouri.

r—Clear quartz crystals in form of an "r" from Hot Springs, Arkansas.

Y—~~Wardite~~ Y in polished half nodule of ~~variscite~~ from Fairfield, Utah.

It takes no imagination to see these letters plainly—all approximately 1½ inch in height, and the veins about ⅛ to ¼ inch wide.

The Blue Star in our window has turned to Gold.

Yet. I thought this might be of interest to the lovers of rocks and minerals, and encourage those on the Honor Roll of Rocks and Minerals Association—where ever they may be. "VICTORY" —so say the everlasting hills.

EDITOR'S NOTE: Mrs. Morris lost a fine son recently—a Lieut. Commander in the Air Force of the Navy—who died "in line of duty", leading his squadron of big bombers against the enemy.

ARAGONITE FIRST FOUND IN SPAIN

Aragonite is calcium carbonate and received its name from the province of Aragon of northeastern Spain where it was first found. The mineral occurs in six-sided crystals (called aragonite triplets), generally brown or red in color, embedded in a ferruginous marl together with gypsum. Sometimes small red crystals of ferruginous quartz are attached to the aragonite.

JOHN A. GRENZIG

John A. Grenzig passed away on Saturday, April 8th, 1944, in his 80th year. In his passing those of us who knew him have lost a true friend, and everyone with a love for minerals, the world over, an inspirational colleague and companion.

His little ads will appear no more in the mineral magazines, ads which really antedate most of us for they started appearing in the pages of the ancient "Mineral Collector" many long years ago. We shall not see his friendly face, and hear his friendly words, at the mineral meetings. We shall never again walk down the dark street, see the crystals in the window, hear the jangle of the doorbell and meet him face to face in the little shop.

His were not great deeds. He did not get his name in the newspapers, write learned articles, make his fortune; and we have no list of particular material accomplishments. All we know of him is that he was a hard and efficient worker at his trade, electrician and sale of electrical appliances, and that he was, beyond that, a student and lover of minerals such as all of us should aspire to be. And he was honest, with a deep sense of integrity, and deep down inside he had true friendliness and liking for other people.

There are few of us who have a kindred feeling for minerals who did not know him because of that. In my own case, he was one of the first collectors I ever knew, and some of my first, and most treasured, specimens were purchased from him. In all the years since then I never remember him without a friendly greeting, a friendly chat and a feeling of pleasure afterwards for having seen him. And so many times I recall his sympathetic attitude towards beginners, especially youngsters, and his willingness to help impart to them some of his own knowledge and to help build up their interest in the subject he loved. I can see him now picking up a specimen, wondering about it, studying it with his lens and trying to understand what lay behind its pattern. That is the spirit of the true student, and he was always that. His fine collection was another proof of how far he had gone with his hobby.

But we knew him best of all because he had a deep, inner liking for humanity, and we were his friends chiefly because of that. How could we fail to like him in return? And that is where he will be especially remembered, by all of us, because he was our friend and because he had kindness in his soul for others. Those were his great deeds, his learned articles and his fame. They were truer greatness, by far, for those qualities of the spirit live on forever. And even as we mourn the passing of him now, his spirit, his kind smile, his handclasp and his friendship continue to be felt among all of us, all of us his friends.

Arthur Montgomery.

MOUNTAINS OF SALT IN COLOMBIA

About 30 miles due north of Bogota, the capital of Colombia, is the little city of Zipaquira (pop. about 10,000). On the outskirts of Zipaquira are huge deposits of rock salt—mountains of it—which extend for many miles and have been worked for centuries. These deposits are worked by the government and the revenue derived from them exceed $1,000,000 per year.

One of the mines is a huge working, guarded by enormous doors. Long adits or passages lead down to immense galleries that have been cut out in the white salt. Due to the electric lights in these galleries, the salt gleams and scintillates in a most dazzling manner.

Beautiful specimens of rock salt (halite), and pyrite crystals, too, are found in the mine.

Zipaquira is in the east central part of Colombia which country is in the northwestern part of South America.

EL VOLCAN DE POPOCATEPETL

By PAUL E. KILLINGER

Popocatepetl Volcano is widely famous as the co-guardian of the famous Valley of Mexico where historic Mexico City is situated. In the Aztec, or to use the more modern name, Nahuatl, dialect, Popocatepetl means "Smoking Mountain" and together with its companion Ixtaccihuatl (The Sleeping Woman or The White Woman, indicating its suggestive profile) form the mythical abodes of many of the ancient Indian gods. These old Aztec gods are still worshipped in a way, by large numbers of the natives.

The 11,000-foot pass between these two peaks was first crossed by white men in the early seventeenth century by Cortez and his party on their famous march from the sea over the mountains to conquer the Aztec capital below. It is now known as the Pass of Cortez. Some of these men are known to have ascended Popo (Popo is the name, shortened, as it is most often heard) in search of sulphur with which to make gunpowder. These men are therefore assumed to have been the first white men, and very probably the first men of any race to ascend Popo.

It is now regularly climbed by the Mexican Exploration Club as well as many other groups and individuals. My ascent belongs in the latter category as the parties I formed or went with merely hired a guide at Amecameca, the small town at the mountains foot. My last ascent this last summer was made in the company of two young ladies and another fellow, all of whom were students at the National University's Summer School.

About one-third of the way up I noticed a cone-shaped projection of reddish-black rock with large volumes of sulphurous steam being emitted from between them. The rest of this climb was uneventful and we arrived on the rim of the immense crater at dawn. More steam and vapors were seen rising from numerous fissures and vents all over the crater's walls and floor. Minute incrustations of sulphur and other volcanic salts were noticed a few feet below the rim but were not of a quality to warrant further investigation.

As mountains go, Popocatepetl, third highest on North America's horizon, is not a hard or dangerous climb but because of the rarity of oxygen is very fatiging.

Further investigations are being planned for next summer when I hope a descent to the floor of the crater will be possible.

GOLD IN CUBA

Gold has been known to occur in Cuba for many years—alluvial gold deposits were worked by the Spaniards as early as 1514.

Gold-bearing gravels occur near Mantua, in the western part of Pinar del Rio Province, about 10 miles from the coast, and on the north side of the Sierra de los Organos, in the western part of the same province. Pinar del Rio is the extreme western province of Cuba.

The richest gold deposits of Cuba are in the Holguin district, in the northern part of Oriente Province, where rich gold veins are found in serpentine. Oriente is the extreme eastern province of Cuba. A nice specimen of native gold in serpentine from the Holguin district is on display in the Mineral Hall (Case 1), at the American Museum of Natural History, in New York City.

Another rich deposit is on the Isle of Pines which lies 33 miles southwest of Cuba. Near the west coast of the island, which belongs to Cuba, is the Esperanza Mine. Here a gold vein, in mica schist, carries arsenopyrite, gold, quartz, silver, and sphalerite.[1]

1 Emmons, W. H. *Gold deposits of the World*. McGraw-Hill Book Co., Inc., New York, 1937, p. 255.

SULTEPEC SILVER MINES OF MEXICO

By HORATIO C. RAY

San Juan, Puerto Rico

A locality noted for fine proustites and pyrargyrites are the silver mines of Sultepec in southern Mexico. Some years ago I was employed at the mines and saw many a fine specimen taken out of the workings.

Location

Sultepec, located in the southern part of the state (or province) of Mexico (60 miles southwest of Mexico City), is reached from Toluca, the capital of the state (now quite a tourist center), first by means of a narrow-gauge railroad to San Juan de las Huertas, then by horseback over a spur of the Monte de Toluca to the town—in a generally westerly direction. I imagine that by now the road to Sultepec has been made accessible to motor traffic.

Some Mines of the District

Sultepec in its time was the scene of many bonanzas (rich veins of ore). The old Presentacion group of mines operated for years—for a long time by Germans. The Munoz mine (twice in bonanzas), the Quimica (in bonanza when I first went there—produced about 15,000,000 pesos, it is said, in a couple of years).

The ores of the district were largely silver either with or without base metals (mostly lead). La Presentacion was always lead-bearing and the ore was melted as was some of the Munoz ore. Part of the ore of the district had been lixiviated by the hyposulfite process.

Mineralogy

The chief minerals of the region were proustite and pyrargyrite (both locally called petlanque). Argentite, the chloride minerals, and others were common. Except in the richer deposits, the silver minerals were disseminated.

The San Juan Bautista mine was a relatively small mine next to the La Presentacion which was in bonanza in 1909-10. Part of it was owned by the wife of Porfirio Diaz, President of Mexico at that time. The manager was a Scotchman, Juan McRae, an old timer. This ore showed no base metals as I remember. It is also my recollection that proustite and pyrargyrite made up the bulk of the ore along with metallic silver. The latter was found mostly in vugs in the vein. A considerable number of pieces of the ore was boxed and sent to somebody in New York City for mineralogical specimens.

I saw a crystal of proustite nearly an inch long, from the San Juan Bautista Mine, which was the most beautiful thing you ever saw! It was sold to some dealer in New York City for $300, so I was informed. This same mine produced silver wire which was almost as fine as a woman's hair; vugs containing it sometimes looked as if an old lady's hair had been cut off and carelessly stuffed therein.

WORLD'S FINEST CINNABARS COME FROM CHINA

The finest crystals of cinnabar known occur in the mercury mines of Wanshanchang (Hamlet of Ten Thousand Hills), Tungyen Prefecture, Kweichow Province, in south central China. The crystals, often of large size, are of bright ruby-red color, many are translucent—often nealy transparent—and are sometimes in excellent twins. The most beautiful crystals, associated with rock crystals, occur in cavities of massive milky quartz.

The Wanshanchang mines are the most important mercury mines in China and have been worked since the 14th century. The orecodies (massive cinnabar which is mercury sulphide) lie in limestone. The ore is mined through tunnels driven into the hills; mining is very primitive.

THE AMATEUR LAPIDARY

AMATEUR LAPIDARY EXPERIENCE

By J. E. ANDRESS

Rockford, Ill.

In the fall of 1941, we drove down via auto from Seattle, Wash., to San Francisco, Calif., picking up Route 101 at Otis, Oregon.

On the trip we became quite interested in searching for agates. First at Seal Rock, Oregon, there is a sign "Agate Beach". It is just off the highway so we drove down to the Pacific, turning the car around on the hard packed wet sands of the beach.

It is the custom of visitors to pick up agates on the shore sands as the waves ebb. However, my brother-in-law, Lon Day, reasoned that agates do not come out of the ocean and therefore are not washed in. So we walked back about a block to the high earthen bank or shore, and there, after a short search about 5 feet up in the bank, discovered a stratum of sand, some 8 or 10 inches thick, and which was loaded with agates with a whitish lime covering. We soon scratched out and picked up all we wanted and left (as the urge of evening dinner time was pressing upon us).

Of course when the tide comes in and during storms the bank is washed by the waves, hence the agates are freed and thus roll back and forth with the ceaseless waves.

At St. Patrick's Point, just northwest of Trinidad, Calif., there is another Agate Beach at the foot of a zig-zag trail down a high steep bank paralleling the ocean at this point. We picked up many agates and other pebbles (washed also from the earthen bank).

Upon arriving in San Francisco, we immediately looked for a lapidary shop. We found one on Geary Street. He polished several of the agates and other specimens for us. In our conversation with him, we learned that his lapidary machine had a ¼ H. P. motor driven vertical spindle in a wooden frame stand, substantially built, so that the abrasive wheels, polishing wheels, etc., run horizontally, with a clever splash guard. The lapidary *sold* me on the horizontal idea as a result of his 25 years experience in the use of both vertical and horizontal spindles.

Having thus become charmed with the beauty of his polished specimens, we commenced to study mineralogy, and gem minerals in particular, hence we gathered on that same trip (which carried us on to Lake Tahoe and Nevada) a considerable variety of gem specimens besides gold and silver ores.

Upon returning to my home in Illinois I ordered a complete lapidary outfit similar to the one used by the lapidary in San Francisco. Since then, during spare winter evenings, I have polished over 200 specimens of gemmy rocks and minerals.

I use for roughing a 60 K abrasive wheel; for semi-finish grinding, a 180 K wheel, and next a 240 abrasive cloth or sanding wheel; then on a felt wheel with FFF flour alundum mixed with water to a paste and brush applied. The final polishing (5th operation) is accomplished on a leather covered wood drum wheel which has a depression turned in the flat of one side, with sponge rubber padding in this recess, over which the calfskin (hair side out) is stretched. Oxide of zinc mixed to a paste and brush applied is used on the leather disc, but tin oxide is preferable, altho now not available until restrictions are lifted after peace has returned.

For grinding and polishing small specimens, they are cemented with special sealing wax to dop sticks, using alcohol lamp for cementing and for softening wax to remove. The back or flat side of a specimen is polished first, then reversed on the dop stick. Clean-

ing may be accomplished by placing the specimens in alcohol for a few minutes, then wiping. When oxide embeds in fine lines, hot water and soap suds scrubbing with an old tooth brush will remove them.

Cabochons seem easiest to form but I have a considerable variety of shapes of polished gem specimens (altho not to be judged for perfection). These include: obsidian, smoky quartz, rouge blanca, agates, chalcedony (also sawed slabs), Lake Superior banded and fortification agates, moss agates, plymerite (Nevada), californite, garnets, labradorite (cat's eye), sunstone (schillerization), opal, jaspers—orbicular, brecciated, etc., tiger eye (blue and honey), Turritella agate, lapis lazuli, beach pebbles, chrysocolla, rhodonite, rhodochrosite, rose quartz, onyx, granite (from Roosevelt Dam, Arizona), thomsonite, cinnabar opal, dumortierite, alabaster, turquoise, malachite, variscite, fluorspar (green fluorite), collinsite with quercyite, and many other varieties of gem minerals.

Practically all above, especially those of gem quality, polish most beautifully with a little time and careful attention.

Amateur lapidary work is a very fascinating and interesting diversion from one's avocation.

DYER SERPENTINE QUARRY NEAR DELIGHT, MD.

By PETER ZODAC

An interesting mineral locality in Maryland is the Dyer serpentine quarry in the northern part of the state. It is much visited by collectors.

Locality

Delight is a small village in the western part of Baltimore County about 12 miles northwest of the city of Baltimore. The quarry is about 1¼ miles west of Delight and 1,000 feet south of the Nicodemus Road. The working is also known as the Nicodemus quarry due to its proximity to the Nicodemus Road.

The quarry is a vertical pit about 300x500 feet in size and 50 feet deep. The product is used as crushed stone. The old Calhoun chrome mine, abandoned since 1880, is in the neighborhood.

Mineralogy

The following minerals have been found at the quarry:

Chromite: Black grains embedded in serpentine.

Deweylite: Very common in 1" veins throughout the serpentine. It is porcelain-white in color but very fragile; also brownish botryoidal masses on white magnesite.

Dolomite: Common in large grayish cleavable rhombs.

Garnierite: Reported by Ostrander and Price.[1]

Limonite: Common as brown stains on many minerals.

Magnesite: Common as porcelain-like, white veins up to ½ inch in thickness in serpentine. Breunnerite occurs as brownish encrustations on serpentine.

Magnetite: Reported by Ostrander and Price as occurring with dolomite and picrolite.

Opal: Common opal, white. Reported by Ostrander and Price.

Quartz: Veins of chalcedony are common in the serpentine. Jasper and moss agate are reported by Ostrander and Price.

Serpentine: Greenish black is the color of the main rock quarried. Nice compact-fibrous to bladed greenish masses Baltimorite, and Williamsite are reported by Ostrander and Price.

Wad: Reported by Ostrander and Price.

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1 Ostrander, C. W., and Price, W. E., Jr., *Minerals of Maryland*, Natural History Society of Maryland, Baltimore, Md., 1940, p. 26.

Club and Society Notes

San Jose Chapter of the R. & M. Association

The meeting of the club on March 10, 1944, was turned over to Mr. E. O. Robbins, who gave a very interesting and instructive talk on "The Atomic Structure of Rocks."

At the meeting of April 7, Crystallography was the subject of Pres. Amens instructive talk, with illustrations of different crystal forms being thrown on the screen by a Bal Optician Projector. Following his talk, Mr. F. F. Rogers was elected President for the next six months; Ruth Durfee, Vice-President; and Mrs. Ruth Stevenson, Sec.-Treasurer.

A. B. Strong,
San Jose, Calif.

Junior Mineral Exchange

This is a mineral club for boys, 13 to 17 years of age, which was recently formed in Revere, Mass. Membership in the club is not restricted to those residing in Revere only, it is open to anyone in the country. To date, the club has members in five states, issues its own bulletin, and is planning to affiliate with the Rocks and Minerals Association. For further particulars apply to the Secretary, Jerome Eisenberg, 77 Victoria St., Revere 51, Mass.

Mineralogical Club of Hartford

At the 6th Annual Meeting of the Club, held at the Administration Building of the Board of Education, 249 High St., Hartford, Conn., on March 8, 1944, the following officers were elected:

President: Franklin P. Rockwell.
Vice-President: Leslie T. Goodrich.
Secretary: Gladys L. Gage.
Treasurer: Harold J. Verrow.

The following appointments were made:

Program Committee: Messrs. Hills, Verrow, and Brandenberger.

Outing Committee: Messrs. Kasey, Pascal, and Safford.

Hospitality: Miss Conant, Mrs. Robinson, and Mrs. Verrow.

Membership: Miss Wraight, Mrs. Hills, and Miss Anderson.

Library: Mrs. Rockwell.

Identification: Messrs. Hills, Verrow, Robinson, and Goodrich.

The programs during the past year have been informative and interesting, covering mineral classes and identification helps. The Program Committee, with the assistance of members, has both planned and presented the material.

Although transportation difficulties have kept many of our members from attending and made it impossible for us to fulfill our schedule of field trips, we have had a successful year.

Gladys L. Gage, Sec.

Pacific Mineral Society

The following are the new officers for 1944:

William C. Oke, President.
C. C. Brunk, 1st Vice-Pres.
M. C. Nichols, 2nd Vice-Pres.
Ruth Nichols, Sec.-Treas.
Harold E. Eales, Field-Trip Chairman.
R H Milligan, Board of Directors
R. J. H. Mittwer, Board of Directors.

Ruth Nichols, Sec.

New York Mineralogical Club

American Museum of Natural History, New York, N. Y., Wednesday, March 15, 1944.

Convened: 8:10 P.M. Attendance: 58.

The meeting was called to order at 8:10 P.M. by the president, Mr. Taylor. Mr. Samuel Sklarew was admitted to membership.

Mr. Sampter, as chairman of the Nominating Committee, reported the renomination of all present officers for the coming year, namely:

Mr. James A. Taylor for President.

Dr. Frederick H. Pough for First Vice-President.

Dr. Robert B. Sosman for Second Vice-President.

Dr. Cecil H. Kindle for Treasurer.

Mr. John N. Trainer and Mr. Gilman S. Stanton for Directors.

Miss Elizabeth Armstrong for Secretary.

In accordance with the constitution of the club the business of the election was laid on the table until the following meeting.

Mr. Ralph J. Holmes of the teaching staff of Columbia University addressed the meeting on "X-Ray Diffraction and Its Role in Modern Mineral Study". He described briefly the various techniques of X-Ray diffraction research: Laue photography, especially useful in discerning crystal symmetry; rotated-crystal methods of space-group analysis; and powder pattern photography for routine identification. Mr. Holmes discussed the use of the powder pattern for analysis of crystal structures of the higher-symmetry crystal systems and emphasized the importance of using all available techniques for such an analysis, including investigation of physical and chemical properties.

As an example of a problem solved by X-Ray research, Mr. Holmes described the analysis of "allemontite" which proved to be a mixture of two different crystalline substances, arsenic and $As_{88}Sb_{88}$.

Respectfully submitted,
Elizabeth Armstrong, Secretary.

With Our Dealers

Choice crystal specimens are offered this month by Oregon's popular dealer, V. D. Hill, of Salem. Everybody likes crystals but if you don't hurry in ordering some there may not be enough for everybody.

A new dealer this month is Col. F. W. King, of Wickliffe, Ky. He is not offering any minerals but some very interesting prehistoric collectors' items such as arrowheads, spear points, beads, pottery, etc. Quite a number of Indian relic collectors take ROCKS AND MINERALS—why say more. Their many orders will speak for them.

Yes, fluorescent minerals do occur in Arkansas and the H. E. Powell Co., of Little Rock are advertising three of them. See their ad.

Unique among minerals is triboluminescent sphalerite and unique would be the collector who would neglect to order a nice specimen from the West Coast Mineral Co., of La Habra, Calif. Don't *YOU* be unique!

Quartz crystals of the finest water clear quality—and from Arkansas! A large number of these fine specimens are in the stock of J. L. Davis, of Hot Springs, Ark.

Minerals of all varieties—crystals, pseudos, etc., at attractive prices—are always in stock at Chas. O. Fernquist's, of Spokane, Wash. What do you need? He has them!

The Rock Colony at Bayfield, Colo., is still growing. Bayfield must be a most attractive place. A collector from New England went there two months ago just to spend a couple of weeks and he is still there. The lure of the Rockies and the many localities around Bayfield are too much for the Easterner. If you, too, want to visit the area get in touch with the Colorado Gem Co., of Bayfield.

Be sure to read the list of happy "Streamliner" users featured this month by Wilf ed C. Eyles, of Bayfield, Colo. Gosh—that manufacturer of diamond saws has customers in every state and his saws are used for every purpose. We bet that some day when Tojo's head is cut open to see what had made him tick, a "Streamliner" will be used for the job!

Minerals for the collector! That sounds like Ward's, of Rochester, N. Y. Sure enough, it's the heading used this month for their advertisement. What are they offering? Agates, scheelites, diamonds, and others.

Oregon nodules! Wyoming jades! Utah Dinosaur bones! Just a few items featured this month by Allan Branham, of Lander, Wyo.

New England's great dealers, Schortman's Minerals, of Easthampton, Mass., are featuring fluorescent minerals and supplies and so large is their stock that to list only a few items it has been necessary to use *TWO* pages. But don't you take *TOO* long *TO* send in your order!

Another new advertiser this month is Ozark Biological Laboratories, of Hot Springs National Park, Ark. And their offerings are beautiful quartz crystals—single crystals, clusters, doubly terminated, odd, modified, and with rare forms—they have them all!

Slabs—slabs—and more slabs! These are offered collectors by A. E. Davies, of Alamo, Calif. Order a dozen or so and polish them at your leisure.

Alaska cinnabar, when associated with limonite and calcite in graywacke, makes an interesting specimen for a collector. Frank H. Waskey, of Aleknagik, Alaska, is the lucky dealer who has a large stock of them.

Lapidary supplies of all descriptions are carried in stock by the great firm of Warner & Grieger, of Pasadena, Calif. Isn't it time for you to order a new supply for your lapidary shop?

Triboluminescent sphalerite—an extremely interesting mineral from Mexico—has recently been received by Chuck Jordan, of Los Angeles, Calif. Have you this interesting mineral in your collection?

L. E. Bagg, formerly of Boulder, Colo., is back again in Peoria, Ariz. His classified ad appears in this issue.

Our dealers can supply anything in minerals except the "ahs" and the "ohs!"